The opinion in support of the decision being entered today was **not** written for publication and is **not** binding precedent of the Board

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex Parte ERIC R. DELANO

Appeal No. 2006-1550
Application No. 10/044,401

ON BRIEF

Before HAIRSTON, JERRY SMITH and HOMERE, **Administrative Patent Judges.**

HOMERE, **Administrative Patent Judge**.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1 through 8, 10 through 14, 16 and 17, all of which are pending in this application. Claims 9 and 15 have been canceled by Appellant.

Invention

Appellant's invention relates generally to a method and system for transmitting data between customized ports (52,54,56, 58) in a crossbar (50) and system agents in a data processing system (100). Each of the plurality ports is customized with an input port (60, 68, 76, 84) for receiving data from a source agent and an output port (62, 70, 78, 86) for

transferring data to a destination agent. Each of the plurality of ports is further customized with a crossbar control data (64, 66, 72, 74, 80, 82, 88, 90) for specifying crossbar control information, and for transferring data from an input port to an output port having different port configurations. The crossbar control data also includes control information for formatting bit length of data from an input port to be transmitted to an output port having less width than the input port.

Claim 1 is representative of the claimed invention and is reproduced as follows:

> 1. A crossbar for providing connections between a plurality of ports and a plurality of system agents via a processing system comprising:
>
> a plurality of ports, each port capable of being an input port customized for receiving data from a source agent and an output port customized for transferring data to a destination agent; and,
>
> crossbar control data for specifying crossbar control information for transferring data from an input port to an output port having different port configurations, said crossbar control data containing control information for formatting bit length of data from an input port to be transmitted to an output port having less width than the input port.

References

The Examiner relies on the following references:

Hsieh et al.	5,717,871	February 10, 1998
Lach	6,363,452	March 26, 2002 (filed Mar. 29, 1999)
Tauchen et al.	6,411,230	June 25, 2002 (filed Apr. 13, 2000)
Aimoto	6,570,876	May 27, 2003 (filed Mar. 30, 1999)
Yokoyama	JP411296473	October 29, 1999

Rejections At Issue

A. Claims 1, 3, 6 through 8 and 11 through 13 stand rejected under 35 U.S.C. § 102 as being anticipated by Yokoyama.

B. Claims 16 and 17 stand rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Yokoyama and Lach. Claims 2 and 14 stand rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Yokoyama and the Appellant's Admitted Prior Art. Claim 4 stands rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Yokoyama and Tauchen. Claim 5 stands rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Yokoyama and Aimoto. Claim 10 stands rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Yokoyama and Hsieh.

Rather than reiterating the arguments of Appellant and the Examiner, the opinion refers to respective details in the Briefs[1] and the Examiner's Answer.[2] Only those arguments actually made by Appellant have been considered in this decision. Arguments, which Appellant could have made but chose not to make in the Briefs have not been taken into consideration. See 37 CFR 41.37(c)(1) (vii) (eff. Sept. 13, 2004).

OPINION

In reaching our decision in this appeal, we have carefully considered the subject matter on appeal, the Examiner's rejections, the arguments in support of the rejections and the evidence of anticipation and obviousness relied upon by the Examiner as support

[1] Appellant filed an Appeal Brief September 30, 2005. Appellant filed a Reply Brief on February 28, 2006.
[2] The Examiner mailed an Examiner's Answer on January 05, 2006. The Examiner mailed an office communication March 15, 2006, stating that the Reply Brief has been entered and considered.

for the rejections. We have, likewise, reviewed and taken into consideration Appellant's arguments set forth in the Briefs along with the Examiner's rationale in support of the rejections and arguments in the rebuttal set forth in the Examiner's Answer.

After full consideration of the record before us, we agree with the Examiner that claims 1, 3, 6 through 8 and 11 through 13 are properly rejected under 35 U.S.C. § 102 as being anticipated by Yokoyama. We also agree with the Examiner that claims 16 and 17 are properly rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Yokoyama and Lach. We further agree with the Examiner that claims 2 and 14 are properly rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Yokoyama and the Appellant's Admitted Prior Art. Furthermore, we agree with the Examiner that claim 4 is properly rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Yokoyama and Tauchen. Additionally, we agree with the Examiner that claim 5 is properly rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Yokoyama and Aimoto. Last, we agree with the Examiner that claim 10 is properly rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Yokoyama and Hsieh. Accordingly, we affirm the Examiner's rejections of claims 1 through 8, 10 through 14, 16 and 17 for the reasons set forth **infra**.

I. Under 35 U.S.C. § 102(b), is the Rejection of Claims 1, 3, 6-8 and 11-13 as Being Anticipated By Yokoyama Proper?

It is axiomatic that anticipation of a claim under § 102 can be found only if the prior art reference discloses every element of the claim. **See In re King**, 801 F.2d 1324, 1326, 231 USPQ 136, 138 (Fed. Cir. 1986) and **Lindemann Maschinenfabrik GMBH v.**

American Hoist & Derrick Co., 730 F.2d 1452, 1458, 221 USPQ 481, 485 (Fed. Cir. 1984).

With respect to the Yokoyama reference, Appellant argues that Yokoyama does not disclose formatting a bit length of data from an input port to be transmitted to an output port having less width than the input port. In particular, at pages 5-6 of the Appeal Brief, Appellant states the following:

> The examiner's reliance on Fig. 24 is not instructive as it merely shows a table of control numbers, i.e., C1 through C9, which essentially seems to show that a 256 bit band can be secured for transmitting 128 bit or 256 bit data, with paragraph 0149 reading "C6 shows the case where 128 bit band can be secured in case 256 bit data are transmitted to a 128 bit port and in case C7 transmits 256 bit data to 128 bit port, it shows the case where a band is not securable." Nowhere else in the specification, to the extent that applicant can understand it, is there any discussion that data is formatted at all.
>
> All of the other cases (C 1-C5 and C8-C9) indicate that data is either smaller or the same size as the output port capacity, and if not, the band is not securable. There is no discussion why or how case C6 differs from case C7 anywhere in the 25 page translation. It is submitted that the described case C6 is either gratuitous or erroneous. Nowhere in the specification does it indicate that data is reformatted to fit the width of the output port if the output port capacity is less than that of the input port.

Appellant further expands on this same argument in the Reply Brief. In particular, at page 6 of the Reply Brief, referring to portions of the Yokoyama reference upon which the Examiner relies, Appellant states the following:

> The above description of the operation of case C6 indicates that a 256 bit bandwidth on an input port that is to be transferred to a 128 bit output port is actually accomplished by assigning two 128 bit bandwidths in which to accommodate the 256 bit input. This is because the address control part 61-1 sends a transfer request to two address lines.
>
> This described operation is also in accord and entirely consistent with the discussion on pages 12-15 which essentially states that communication between ports of different sized data width is carried out by an empty port among the ports to which the boards with the wide data are connected. This described operation is further underscored by the fact that in the entire translation, there is no discussion whatsoever, at least as determined by the undersigned, that any reformatting is ever undertaken or accomplished. Certainly, there is nothing that even approaches the

discussion contained in the specification of the present application on page 12, lines 8-11: "For example, if a 24 bit width input port requests to transmit data to an output port with an 8 bit width, the data will then be shifted or divided into 8 bit[s] for each transmission. Since there are 24 bits total, the data will be transmitted 8 bits at a time until all 24 bits are sent."

To determine whether claim 1 is anticipated, we must first determine the scope of the claim. We note that claim 1 reads in part as follows:

> "crossbar control data for specifying crossbar control information for transferring data from an input port to an output port having different port configurations, said crossbar control data containing control information for formatting bit length of data from an input port to be transmitted to an output port having less width than the input port."

At page 12, paragraph 0030, lines 1-12, Appellant's specification states:

> "However, if the width of the input port is more than the width of the output port (block 200), modification to the data is necessary in order to transmit the data to a port with less available width. Thus, the width of the output port must be ascertained (block 204) in order to format the data from the input port to data configured for the width of the output port (block 206). The formatted data will be submitted as the processed data. In practice, the data will be transmitted by shifting the data bits to the width of the output port. For example, if a 24 bit width input port requests to transmit data to an output port with an 8 bit width, the data will then be shifted or divided into 8 bit for each transmission. Since there are 24 bits total, the data will be transmitted 8 bits at a time until all 24 bits are sent. This can be done either through the use of a MUX or a shift register."

Thus, the claim does require formatting a bit length of data from an input to be transmitted to an output port having less width than the input port.

Our reviewing court states in **In re Zletz**, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) that "claims must be interpreted as broadly as their terms reasonably allow." Our reviewing court further states, "[t]he 'ordinary meaning' of a claim term is its meaning to the ordinary artisan after reading the entire patent." **Phillips v. AWH Corp.**, 415 F.3d 1303, 1321, 75 USPQ2d 1321, 1332 (Fed. Cir. 2005).

Upon our review of Appellant's specification, we fail to find any definition of the term "formatting" that is different from the ordinary meaning. We find the ordinary meaning of the term "formatting" is best found in the dictionary. We note that the definition most suitable for "formatting" is "arranging" or "laying out."[3]

We also note that Appellant's specification indicates that formatting the data bit length merely entails dividing or shifting (i.e. arranging) the data bits of the input port to fit the width of the output port.

Now the question before us is what Yokoyama would have taught to one of ordinary skill in the art? To answer this question, we find the following facts:

1. At page 16, paragraph 0021, Yokoyama states the following:

> [0021] The crossbar switch 5 has 12 ports of 128 bits, and I/O (input and output) boards (#1-#4) 4-1 to 4-4 with a data width of 128 bits are connected as they are to the ports of 128 /5 bits, and processor boards 2-1 and 2-2 and memory boards 3-1 and 3-2 with a data width of 256 bits are respectively connected to two ports of 128 bits.

2. At page 54, paragraph 0149, Yokoyama states the following:

> [0149] C6 shows the case where a band of 128 bits can be secured when data of 256 bits are transferred to a 128-bit port, and C7 shows the case where a band cannot be secured when data of 256 bits are transferred to a 128-bit port.

3. At page 65 paragraph 0185, Yokoyama states the following:

> [0185] In the case where a band of 128 bits can be secured when data of 256 bits are transferred to a 128-bit port (the case C6), the crossbar switch side address control part 61-1 at the request side sends a transfer request to any of two address lines. The crossbar switch side address control part 61-1 at the supply side detects the transfer request of the address line (processing C6-1).

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[3] Webster's II New Riverside University Dictionary, 1988, page 499. Copy provided to Appellant.

With the above discussion in mind, we find that Yokoyama teaches formatting a bit length of data from an input port to be transmitted to an output port having less width than the input port. One of ordinary skill in the art would have duly recognized that Yokoyama's teaching of rearranging a 256 bit input bandwidth by dividing it into two 128 bit bandwidths to thereby allow the data (of the wider input port) to be communicated to the (narrower) 128 bit output port is equivalent to the bit length of data formatting, as set forth in representative claim 1. Consequently, we find no error in the Examiner's stated position, which concludes that Yokoyama teaches formatting a bit length of data from an input port to be transmitted to an output port having less width than the input port. Therefore, we will sustain the Examiner's rejection of claims 1, 3, 6-8 and 11-13 under 35 U.S.C. § 102(b).

II. Under 35 U.S.C. § 103, is the Rejection of Claims 16 and 17 as Being Unpatentable over the combination of Yokoyama and Appellant's Lach Proper?

In rejecting claims under 35 U.S.C. § 103, the Examiner bears the initial burden of establishing a **prima facie** case of obviousness. **In re Oetiker**, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). **See also In re Piasecki**, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984). The Examiner can satisfy this burden by showing that some objective teaching in the prior art or knowledge generally available to one of ordinary skill in the art suggests the claimed subject matter. **In re Fine**, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Only if this initial burden is met does the burden of coming forward with evidence or argument shift to the Appellants. **Oetiker**, 977 F.2d at 1445, 24 USPQ2d at 1444. **See also Piasecki**, 745 F.2d at 1472, 223 USPQ at 788.

An obviousness analysis commences with a review and consideration of all the pertinent evidence and arguments. "In reviewing the [E]xaminer's decision on appeal, the Board must necessarily weigh all of the evidence and argument." **Oetiker**, 977 F.2d at 1445, 24 USPQ2d at 1444. "[T]he Board must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the agency's conclusion." **In re Lee**, 277 F.3d 1338, 1344, 61 USPQ2d 1430, 1434 (Fed. Cir. 2002).

With respect to independent claims 16 and 17, Appellant argues at page 8 of the Appeal Brief that Yokoyama does not teach the steps of determining whether the width of the input port is more than the width of the output port; submitting the data as processed when the width of the input port is not more than the width of the output port; obtaining the width of the output port when the width of the input port is greater than the width of the output port; formatting the data from the input port to data configured for the obtained width of the output port; submitting the formatted data as the processed data. Further, Appellant argues that Lach does not cure these deficiencies.

We note that claims 16 and 17 read in part as follows:

> " determining whether the width of the input port is more than the width of the output port; submitting the data as processed data when the width of the input port is not more than the width of the output port; obtaining the width of the output port when the width of the input port is greater than width of the output port; formatting the data from the input port to data configured for the obtained width of the output port; submitting the formatted data as the processed data."

At pages 11-12, paragraphs 0029-0030, Appellant's specification states:

> Based on port configuration of different widths, the first step in the processing method (block 196) is to determine whether the width of the input port is greater than the width of the output port (block 200). If not, the data are submitted as processed data (block 202) back to the method shown in FIG. 4, since it is not

> necessary to format data with smaller length bit that can be read by width with greater length bit. In other words, a 24 bit width port can read any data bits that are equal to or fewer than 24 bit length, but not data that are more than 24 bit length.
>
> [0030] However, if the width of the input port is more than the width of the output port (block 200), modification to the data is necessary in order to transmit the data to a port with less available width. Thus, the width of the output port must be ascertained (block 204) in order to format the data from the input port to data configured for the width of the output port (block 206). The formatted data will be submitted as the processed data. In practice, the data will be transmitted by shifting the data bits to the width of the output port. For example, if a 24 bit width input port requests to transmit data to an output port with an 8 bit width, the data will then be shifted or divided into 8 bit for each transmission. Since there are 24 bits total, the data will be transmitted 8 bits at a time until all 24 bits are sent. This can be done either through the use of a MUX or a shift register.

Thus, the claims do require determining whether the width of the input port is more than the width of the output port; submitting the data as processed when the width of the input port is not more than the width of the output port; obtaining the width of the output port when the width of the input port is greater than width of the output port; formatting the data from the input port to data configured for the obtained width of the output port; submitting the formatted data as the processed data.

Now the question before us is what the combination of Yokoyama and Lach would have taught to one of ordinary skill in the art? To answer this question, we find the following facts:

At page 54, paragraphs 0147 through 150, Yokoyama states the following:

> [0147] Figure 24 shows the division of a data transfer in the crossbar switch device 1 of an application example of the present invention. In the figure, C1 shows the case where a band of 256 bits can be secured when data of 256 bits are transferred to a 256-bit port, C2 shows the case where a band/14 of 128 bits can be secured when data of 256 bits are transferred to a 256-bit port, and C3 shows the case where a band cannot be secured when data of 256 bits are transferred to a 256-bit port.

> [0148] C4 shows the case where a band of 128 bits can be secured when data of 128 bits are transferred to a 256-bit port, and C5 shows the case where a band cannot be secured when data of 128 bits are transferred to a 256-bit port.
> [0149] C6 shows the case where a band of 128 bits can be secured when data of 256 bits are transferred to a 128-bit port, and C7 shows the case where a band cannot be secured when data of 256 bits are transferred to a 128-bit port.
> [0150] C8 shows the case where a band of 128 bits can be secured when data of 128 bits are transferred to a 128-bit port, and C9 shows the case where a band cannot be secured when data of 128 bits are transferred to a 128-bit port.

We agree with the Examiner that the combination of Yokoyama and Lach does teach the invention as set forth in claims 16 and 17. Particularly, as noted in the discussion of claim 1 above, Yokoyama teaches rearranging an input bandwidth by dividing it into two output bandwidths of equal size when the width of the output port is smaller than that of the input port. Further, according to Yokoyama's teaching, there is no need to rearrange an input bandwidth when it is to be transferred to an output port of the same or larger bandwidth. The ordinary skilled artisan would have duly recognized from Yokoyama's teachings that a determination of whether the bandwidth of the input port is larger or smaller than that of the output port would need to be made before deciding on whether to format the input data or not, and before transferring such input data to the output port. We, thus, find no deficiencies in the Yokoyama reference for the Lach reference to cure. Consequently, we find no error in the Examiner's stated position, which concludes that the combination of Yokoyama and Lach teaches the steps of determining whether the width of the input port is more than the width of the output port; submitting the data as processed when the width of the input port is not more than the width of the output port; obtaining the width of the output port when the width of the input port is greater than the width of the output port; formatting the data from the input

port to data configured for the obtained width of the output port; submitting the formatted data as the processed data.

It is our view, after consideration of the record before us, that the evidence relied upon and the level of skill in the particular art would have suggested to one of ordinary skill in the art the invention as set forth in claims 16 and 17. Accordingly, we will sustain the Examiner's rejection of claims 16 and 17.

Now, turning to the following rejections:

i. Claims 2 and 14 stand rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Yokoyama and the Appellant's Admitted Prior Art.

ii. Claim 4 stands rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Yokoyama and Tauchen.

iii. Claim 5 stands rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Yokoyama and Aimoto.

iv. Claim 10 stands rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Yokoyama and Hsieh.

At page 1 of the Reply Brief, Appellant indicates that these claims will either stand or fall upon the interpretation and characterization of the Yokoyama reference. We agree. In light of the discussion that we provided for claim 1 in section I above, we find that the Examiner's combination of the Yokoyama reference with the other references mentioned above is proper in each instance to render claims 2, 4, 5, 10 and 14 obvious. It is our view, after consideration of the record before us, that the evidence relied upon and the level of skill in the particular art would have suggested to one of ordinary skill in the

art the invention as set forth in claims 2, 4, 5, 10 and 14. Accordingly, we will sustain the Examiner's rejection of claims 2, 4, 5, 10 and 14.

CONCLUSION

In view of the foregoing discussion, we have sustained the Examiner's decision rejecting claims 1, 3, 6-8 and 11-13 under 35 U.S.C. § 102. We have also sustained the Examiner's decision rejecting claims 2, 4, 5, 10, 14, 16 and 17 under 35 U.S.C. § 103. Therefore, we affirm.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

KENNETH W. HAIRSTON)
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